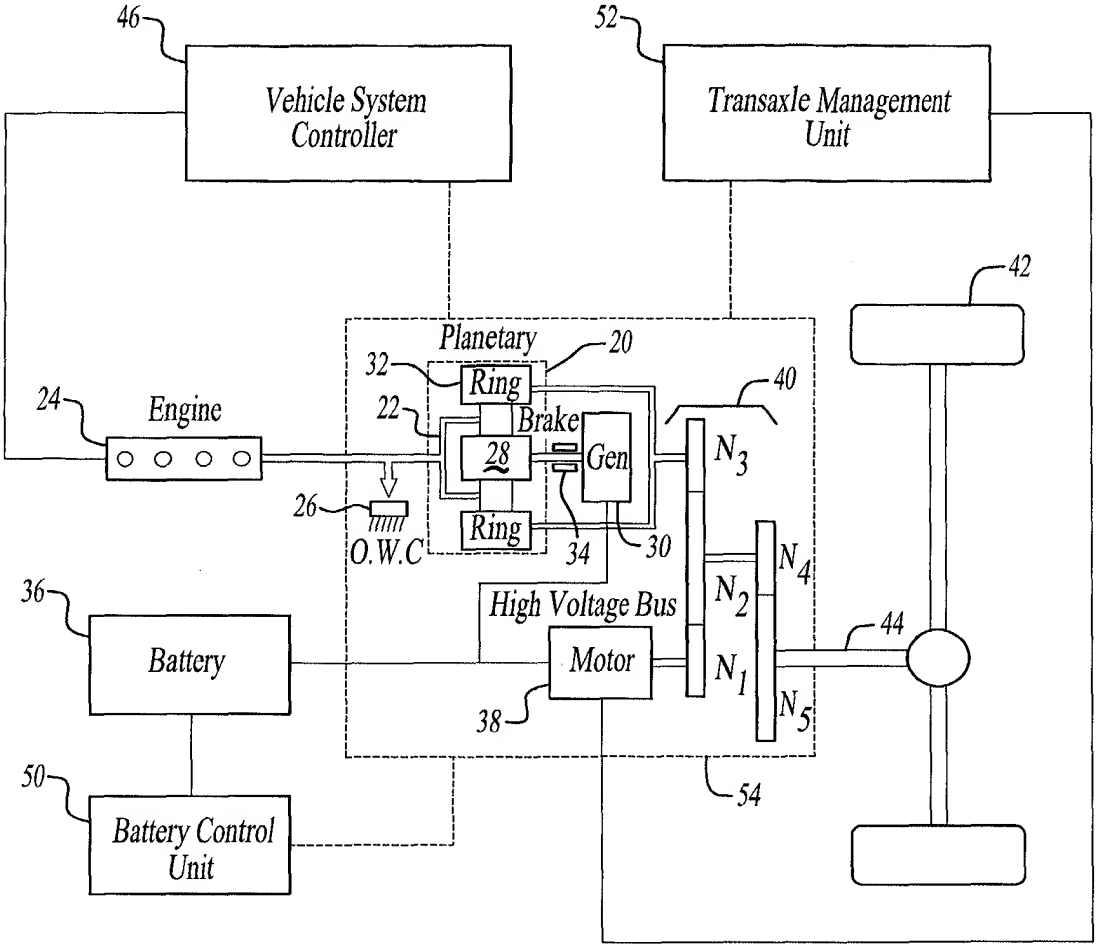
46
Vehicle System Controller
52
Transaxle Management Unit
42
Planetary
20
32
Ring
40
24
Engine
22
Brake
28
Gen
N_3
26
O.W.C
Ring
34
30
N_4
N_2
36
High Voltage Bus
44
Battery
Motor
N_1
N_5
38
50
Battery Control Unit
54

Fig-1

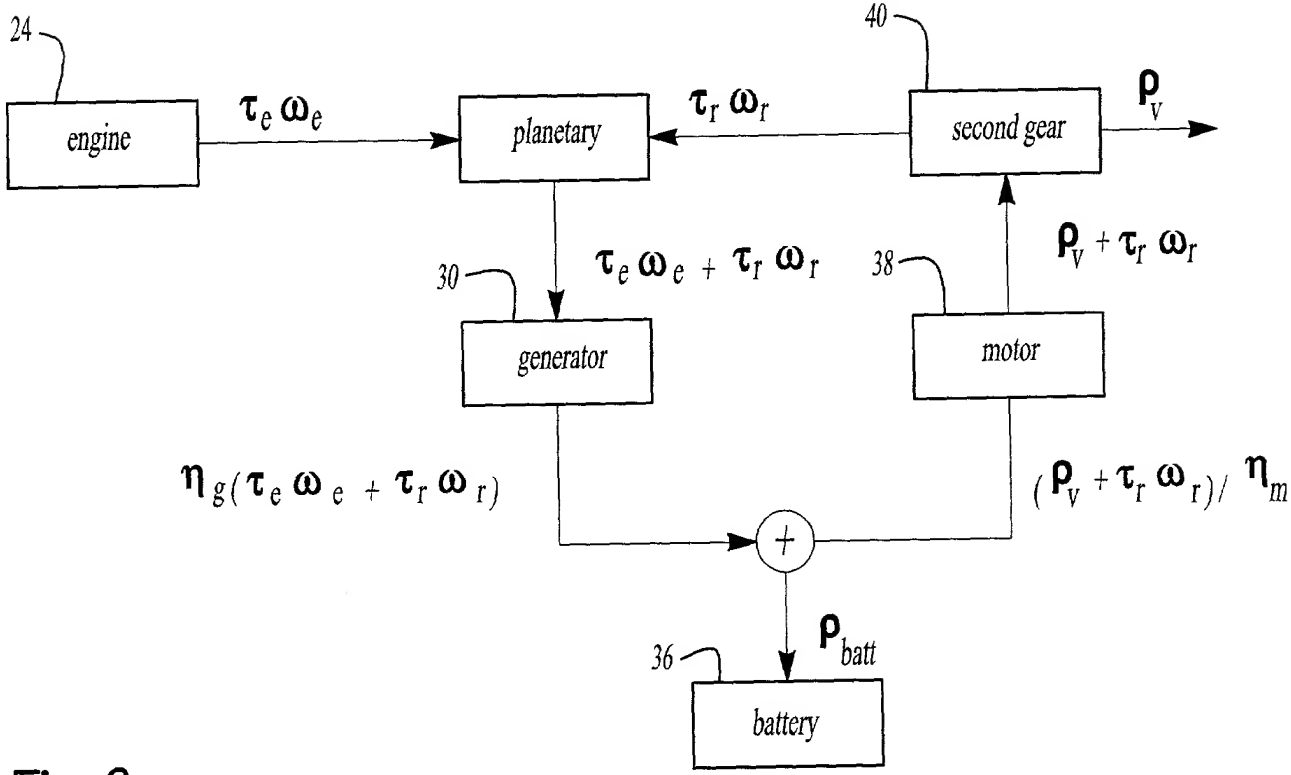
24
engine
$\tau_e \omega_e$
planetary
$\tau_r \omega_r$
40
second gear
ρ_v
$\tau_e \omega_e + \tau_r \omega_r$
30
generator
38
motor
$\rho_v + \tau_r \omega_r$
$\eta_g(\tau_e \omega_e + \tau_r \omega_r)$
$(\rho_v + \tau_r \omega_r)/\eta_m$
+
ρ_{batt}
36
battery

Fig-2

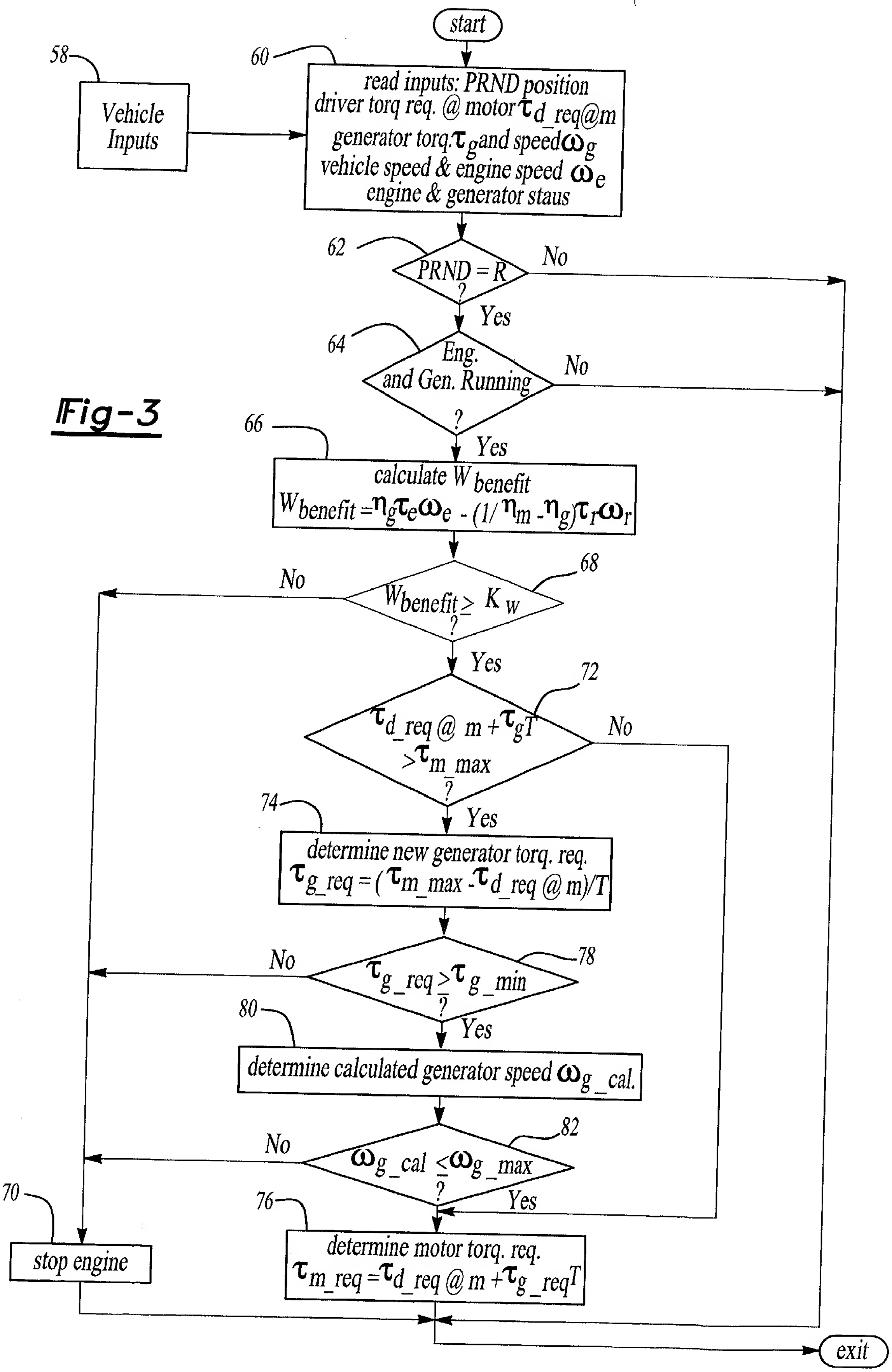
start
58
Vehicle Inputs
60
read inputs: PRND position
driver torq req. @ motor $\tau_{d\_req@m}$
generator torq. τ_g and speed ω_g
vehicle speed & engine speed ω_e
engine & generator staus
62
PRND = R ?
No
Yes
64
Eng. and Gen. Running ?
No
Yes
66
calculate $W_{benefit}$
$W_{benefit} = \eta_g \tau_e \omega_e - (1/\eta_m - \eta_g)\tau_r \omega_r$
No
68
$W_{benefit} \geq K_w$?
Yes
72
$\tau_{d\_req\,@\,m} + \tau_g T > \tau_{m\_max}$?
No
74
Yes
determine new generator torq. req.
$\tau_{g\_req} = (\tau_{m\_max} - \tau_{d\_req\,@\,m})/T$
No
78
$\tau_{g\_req} \geq \tau_{g\_min}$?
80
Yes
determine calculated generator speed $\omega_{g\_cal.}$
No
82
$\omega_{g\_cal} \leq \omega_{g\_max}$?
70
76
Yes
stop engine
determine motor torq. req.
$\tau_{m\_req} = \tau_{d\_req\,@\,m} + \tau_{g\_req} T$
exit

Fig-3